February 10, 1987

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Dear Mr. Farrar:

SUBJECT: REMOVAL OF RTD BYPASS MANIFOLD - REQUEST FOR ADDITIONAL INFORMATION

By letter dated December 23, 1986, you requested an amendment to the Byron Technical Specifications to accommodate removal of the resistance temperature detectors (RTD) bypass manifold system. Enclosed is a request for additional information that we need to complete our review. In order to complete our review by February 28, 1987, we need this information by February 13, 1987.

The reporting and/or recordkeeping requirements of this letter affect fewer than ten respondents; therefore, OMB clearance is not required under PL 96-511.

/s/

Leonard N. Olshan, Project Manager
Project Directorate #3
Division of PWR Licensing-A

Enclosure:
As stated

cc: See next page

PD#3
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2/10/87

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION
REGARDING RTD BYPASS MANIFOLD REMOVAL

1. Provide a discussion on the setpoint methodology and error allowances used to establish the revised technical specification allowable values for the Overpower ΔT, Overtemperature ΔT and Low Reactor Coolant Flow reactor trips and for the Low-low Tavg (P-12) interlock resulting from the RTD bypass manifold removal.

2. Provide a discussion of the equipment environmental qualification as related to compliance with 10 CFR 50.49.

3. A bias for a failed T hot signal is discussed on page 2 of Attachment C to Commonwealth Edison's letter dated December 23, 1986. Provide a discussion on how a bias value is determined and how this value is manually entered into the system.

4. The last sentence in the second paragraph on page 26 of WCAP-11323 states: "Non-safety related control signals continue to be derived from protection channels." This statement seems to be in error since the current RTD installation has RTD's dedicated to control system usage. Please explain.

5. Section 5.0 of WCAP-11323 discusses control system inputs of Tavg. Development of this signal is not covered in the text or in Figure 1.3-1 of the WCAP. Please discuss where (in the control or protection system) and how the three hot leg RTD signals are summed and Tavg is computed.

6. A change in flow measurement uncertainty is shown in the Tech Spec basis on page B 3/4 2-4. However, corresponding changes in the main body of the Tech Spec are not presented. Usually the flow measurement uncertainty value is quoted initially in the main body of the Tech Spec and any change also affects a change in the minimum RCS flow value in gpm.

7. For RTD failures you state on page 5 of WCAP-11324 that there is a spare RTD available in the cold leg. However, you state that a failure of an RTD in the hot leg will require manual action to defeat the failed signal and that a manual rescaling will be made of the electronics to average the remaining signals shown in Figure 1.3-1. What is the time interval to defeat the failed signal? What is the time interval to rescale the electronics to average the remaining signals? Describe the steps involved in this process.

8. In Table 2.1-1 of WCAP-11324, Response Time Parameters for RCS Temperature Measurement, the RTD filter time constant (sec) is shown to be zero. In Section 5.0 of WCAP-11324 (page 54) there is reference to Table 2.1-1 and a statement indicating that there may be a need to modify control system setpoints (see Question No. 15). Is there a possibility that the values in Table 2.1-1 will need modification after observing the startup results?

9. You state on page 13 of WCAP-11324 that with the latest Westinghouse RTD cross-calibration procedure (resulting in lower RTD calibration uncertainties at the beginning of a fuel cycle) it is possible to reduce the RCS flow measurement uncertainty. Please describe what this method is, how it differs with the previous method, and the amount of reduction in flow measurement uncertainty achieved by using this new RTD cross-calibration method.

10. You state on page 13 of WCAP-11324 that with the use of three T_{HOT} RTDs (resulting from the elimination of the RTD bypass lines) the RCS flow uncertainty value is reduced. Please provide a comparison of the improved accuracy of the new RTDs with the old RTDs and the improvement in flow measurement due this change. In Section 4.2 of WCAP-11324 it is stated that RTD error is increased (see Question No. 14). Please explain these statements that seems to be opposed to each other.

11. You state on page 14 of WCAP-11324 that the overall temperature streaming uncertainty applied to the calorimetric flow measurement is only slightly larger than the uncertainty used in the previous analyses. Please provide the values for comparison and indicate the amount that this change of value has on the flow measurement uncertainty.

12. In the last paragraph on page 15 of WCAP-11324 it is stated that test data has been collected to provide a plus or minus value for a bias to be applied if one of the three RTDs is out of service. How is the bias value determined for a particular out-of-service RTD since the temperature value of each RTD (120° apart) may differ depending on its circumferential position? You state that this provision for operating with only two hot leg RTDs in service in done through the electronic system. Is a manual operation required (see Question No. 7)? When will the failed RTD be replaced? Is there a written rule for this in the FSAR or Tech Specs? If two of the three RTDs should fail, what steps would be taken?

13. The results of the flow measurement uncertainty analysis are presented in Tables 3.1-1 to 3.1-4 on pages 16 to 19 of WCAP-11324 and are currently being reviewed. In a previous analysis for another plant, it was not possible to verify the results because some of the information had plus or minus values for which the minus values were not identified. Do any of the values presented have missing signs that need to be accounted for? If so, provide the information needed. Also, Table 3.1-1 lacks information on the values for parameters (SCA, M&TE, SPE, STE, etc.) that are used for obtaining the channel allowance, CSA. Please supply these values and the formulas for combining the parameters to obtain the CSA value for both the plant process computer and the special test equipment or a DVM at the input to the racks.

14. You state on page 21 of WCAP-11324 that the results of system uncertainty verify that sufficient allowance exists in the reactor protection system setpoints to account for the increased RTD error for the new RdF RTDs. Because of this, you state the current values of the nominal setpoints noted above (Section 4.? of WCAP-11324), as defined by the Byron Technical Specifications, remain valid. Please provide the results of the uncertainty calculations and show how they verify that there is sufficient allowance in the reactor protection setpoints to account for the increased RTD temperature error. Show what the RTD error is now and what it was before.

15. You state on page 54 of WCAP-11324 that - "The need to modify control system setpoints will be determined during plant startup following installation of the new RTD system by observing control system behavior" and you also refer to Table 2.1-1 which gives RTD system time response parameters. Is there a possibility that the values in Table 2.1-1 will need modification after observing the startup results?

16. Describe the actual hardware changes and activities that will be made to accomplish the proposed modifications. Include those construction steps which result in occupational exposure to personnel or generate radioactive waste. Identify differences, if any, in these changes and activities for the two Byron units.

17. Provide an estimate of the occupational radiation dose determined for the overall modification project for each unit. This should include the following:
    (a) doses and manpower for major subtasks;
    (b) typical dose rates expected; and
    (c) maximum dose rates expected, and locations.

18. Provide a comparison of occupational dose estimated for task performance and expected dose reduction (e.g., reduced leakage and maintenance, ISI requirements reduced, reduced numbers of shutdowns, reduced general area dose rates, fewer "hot spots" and crud traps) over plant life as a result of these modifications.

19. Identify measures to be taken to assure that doses to workers during task performance will be ALARA. This should cover, for example, task planning, special training, use of mockups, area and system decontamination and airborne radioactivity, efforts to minimize number of workers, and application of experience from similar efforts in the industry.

20. Identify the types and volumes of radioactive waste which are expected to be generated (e.g., piping, components, insulation), and discuss disposal plans for these wastes.

21. Identify and briefly discuss any special radiological problems which may be associated with this task (e.g., very high dose rates, very high contamination levels, high radioiodine levels, need for multiple dosimetry, brief stay times).